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A METHOD OF SUBSCRIBER TELEPHONE LINE SHARING

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(56)　Prior Art Documents
　　　CA 2084011
　　　US 5056132
　　　US 5471522

(57)　Although call-waiting detection is known in voice devices (such as PABX style phones and mobile phones) there is no evidence to suggest this feature was available in non-voice devices, and with subsequent enabling of passage of the incoming voice call.

Claim

1　Computer hardware or software that identifies or detects, whilst the telephone line is being used by a modem or other non-voice transmission/reception device call waiting or their functional equivalent signal(s) or tone(s) and subsequently enables the passage of this incoming call, represented by the detected signal(s), to be received by that same telephone subscriber who is engaged in the use of said non-voice transmission/reception devices.

2　Computer hardware or software as claimed in claim 1 that upon detection of the call waiting or equivalent signal disconnects (i e terminates) the current modem or non-voice transmission in favour of, (i e allowing through) and without loss of the detected incoming call

3.　Computer hardware or software as claimed in claim 1 that, upon detection of the call waiting or equivalent signal, suspends, (i e does not disconnect) the modem or non-voice transmission session but allows or switches the detected incoming call through and whereupon termination of said incoming call resumes or switches back to the modem or non-voice data session without the need to re-dial or reconnect the original telephonic connection

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PETTY PATENT SPECIFICATION

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APPLICANT: JOHN DAVID REISNER
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Invention Title:

A METHOD OF SUBSCRIBER TELEPHONE LINE SHARING

The invention is described in the following statement:

Technical Field

The invention relates to telecommunications in general and to the interface between different consumer/telephone-subscriber communications equipment amongst themselves, with personal computers and the public switched telephone network (PSTN).

Background of the Invention

The capacity for telephone line sharing is a well-known and long-standing historical feature of the PSTN. Examples of this may be observed with party telephone lines. More contemporary examples may be drawn from modern PSTNs and private branch exchanges.

These systems are engineered to provide line-sharing capacity between or within identical equipment categories that use the PSTN. For example, the same or different telephones may share a single telephone line or two or more modems may share, (i.e. operate across) a particular telephone line by means of digital multiplexing techniques. Mindful that the common usage of the term "sharing", as it sometimes applies to telephone connections, as for example facsimile machine and telephone line sharing, does not describe the understanding of the term "sharing" used here. In the case cited above line sharing between, for example a facsimile machine and a telephone, these devices do not share the telephone line whilst each of them is in operation. They share the line in the sense that they both use the same line when active but when one device is active the other one cannot be used.

Similarly, a telephone and a modem cannot operate across a single telephone line simultaneously without surrendering, i.e. disconnecting their respective connections first. This involves both inconvenience and expense to consumers.

When a modem is in use the consumer cannot receive incoming telephone calls nor can the subscriber make a telephone call without disconnecting the modem connection and then incurring the expense of a new telephone call. Similarly, for a particular phone line, the consumer cannot use a modem whilst the telephone is in use.

This problem has particular reference to wide spread use of the internet. Internet users, unless they bear the expense of a separate telephone line, must forgo the ability to receive or initiate telephone calls whilst they are connected by modem to their internet service providers.

Brief Summary of the Invention

This invention is directed toward solving these and other problems. The system and method which best embody the present invention solve these problems by providing computer software or hardware, which addresses a modem, attached to a telephone and connected to the PSTN, which takes advantage of the existing capabilities of modern PSTNs.

Using existing facilities of modern PSTNs an operating modem and a suitably programmed computer, can detect in-coming telephone calls, notify the modem user of the in-coming call and permit the modem user the option to suspend his modem activities to answer the call. Additionally, a modem user can simultaneously make an outgoing telephone call.

All these activities are executed without the need of the modem user to disconnect the modem connection before undertaking an incoming or outgoing voice, facsimile, modem or other call.

Detailed Description of the Invention

In modern PSTNs there are many tones used to identify a condition or state of the PSTN as it pertains to the activities of individual subscribers, i.e. telephone users. These PSTNs use standard call progress tone levels, frequencies and line interruption rates usually specified within strict tolerances on levels, frequencies and distortion. They describe such tones as Dial tones, Busy tones etc.

One of these distinct tones is known as a call-waiting tone. This is a tone currently generated by the PSTN into a subscriber's telephone earpiece informing the subscriber, who is engaged in using the telephone, that another caller is attempting to get through. Subscribers can then, at their option, choose to place their current party on hold, by executing a few defined keystrokes on their telephone dial, and speak to the new, incoming caller. Upon termination of the second call, the subscriber can then resume their conversation with the original caller, again by punching in a defined series of keystrokes.

These call-waiting tones are presently a nuisance for modem users because they can disrupt the modem connection and even terminate it. Often modem users must turn off their call-waiting facility in order to ensure a clear, disruption free modem session. Another advantage of this invention will be to remove the need for modem users to disable their call-waiting capability.

This invention provides for either a computer program or computer hardware which will direct a modem to capture a range of signals, which fall within the tolerances of the defined call-waiting tones, display a message to the modem user on a computer screen and either automatically or at the modem user's discretion execute a series of tones which will place the modem connection on hold and allow the incoming call to get through.

Monitoring the termination of the second incoming call, by monitoring the opening or closing of the loop connection of the device(s) attached to the modem, the modem can then automatically resume its original session by executing the tones necessary to recall the original call. This latter part of the process, resumption of the original call, may optionally be left for the modem user to perform manually.

Turning to the diagram, one embodiment of the invention is depicted. A modem (1) part of a personal computer (2) is connected to the PSTN and currently engaged through a subscriber's telephone line, indicated by the solid lines. The subscriber's telephone (3) is connected to the modem but is idle, indicated by the dashed lines. A computer program, for example, (4), resident within the computer's memory and in control of the modem detects an incoming call by the call waiting tone issued by the PSTN. By capturing this tone, the computer program instructs the modem to send out a response tone that will suspend the modem's connection and allow the incoming call through to the subscriber. When the device, attached to the modem, in this case a telephone, is finished, the modem again issues a tone to the PSTN instructing the resumption of the original modem connection.

Similarly, initiation of the suspension of the modem connection could be from the subscriber's end where, in this case, the subscriber would like

itself whilst a phone call is executed by the subscriber. Upon termination of the call, the modem would re-establish itself.

A modem user can thus be at no more commercial or social disadvantage in the use of telephone lines than an average telephone user who has access to the call-waiting facility provided by modern PSTNs.

Of course various changes and modifications to the illustrative embodiment described will be apparent to those skilled in the art. For example, instead of having a telephone connected to the modem a piece of equipment, (e.g. a fax switch), capable of distinguishing whether the incoming call is voice, facsimile or digital data communication could be attached and the incoming call then re-directed to the relevant secondary device.

Alternatively, a variation of the above might involve the recording of a voice message which the computer will transmit automatically, after suspension of the modem line, informing the caller to wait a few moments before their call is answered. Still other features of the software used to capture the call-waiting tones would permit the user to nominate, (i.e. customise), the modem's response tones to the received call-waiting signal. This would be useful in that whereas international standards may exist regarding the PSTN's generation of call-waiting tones, the user response tones used to execute the facility may differ from country to country or from locality to locality.

Still another variation might consist of a small piece of hardware that upon detection of the incoming call makes an audible or other signal from which point the subscriber may respond at their discretion about whether or not they wish to accept the redirected interrupting incoming call

There are many minor or incidental features which may be attached to this method of dealing with incoming calls whilst the telephone line is otherwise busy with non-voice activities particularly regarding options for customizing the execution of this method to suit the particular preferences or usage patterns of non-voice equipment by individual subscribers By example. this may typically take the form of different on/off times for this method to operate, or cancellation of this method after a specified number of interruptions per data session
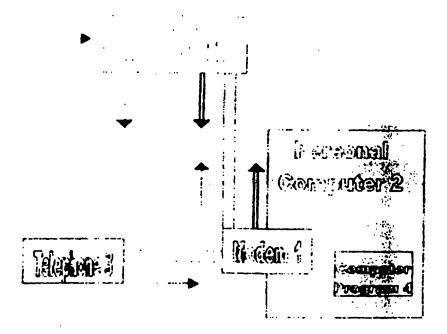
John David Reisner

1 August, 1998

We claim

1   Computer hardware or software that identifies or detects whilst the telephone line is being used by a modem or other non-voice transmission/reception device call waiting or their functional equivalent signal(s) or tone(s) and subsequently enables the passage of this incoming call represented by the detected signals to be received by that same telephone subscriber who is engaged in the use of said non-voice transmission/reception devices

2   Computer hardware or software as claimed in claim 1 that upon detection of the call waiting or equivalent signal disconnects. (i e terminates) the current modem or non-voice transmission in favour of. (i e allowing through) and without loss of the detected incoming call

3   Computer hardware or software as claimed in claim 1 that upon detection of the call waiting or equivalent signal. suspends. (i e does not disconnect) the modem or non-voice transmission session but allows or switches the detected incoming call through and whereupon termination of said incoming call resumes or switches back to the modem or non-voice data session without the need to re-dial or reconnect the original telephonic connection

Dated this 01st day of August 1998

JOHN DAVID REISNER

By the Applicant and Inventor

Diagram 11

Personal Computer 2

Modem 1

Telephone 3

Computer Program 4

▶	Incoming Call
---▶	Outgoing Call
━▶	Tonal Responses